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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,168	12/18/2001	Ralf Dorscheid	DE000234	5133

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EXAMINER

REIS, TRAVIS M

ART UNIT	PAPER NUMBER
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2859

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/023,168	Applicant(s) DORSCHIED ET AL.	
	Examiner Travis M. Reis	Art Unit 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on: 11 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 9-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 12-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 6, 7, & 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman (U.S. Patent App. Pub. 20020070343) in view of Kaifu et al. (U.S. Patent 6528796), Wu et al. (U.S. Patent 5770706) & Haruo et al. (JP 09054162 A).

Hoffman discloses a detector for the detection of electromagnetic radiation, i.e. X-rays (pg 2 para 0018 line 7), of which said detector includes a scintillator (54), a semiconductor chip (52), and a ceramic base element (74), wherein a respective intermediate layer that is defined in respect of its gap width is arranged each time between the scintillator and the semiconductor chip and a layer between the semiconductor chip and the basic element, wherein said intermediate layers contains an adhesive (86), wherein said adhesive has some quantities applied to the surface of the scintillator that faces the semiconductor chip as well as to the rear surfaces of the semiconductor chip and the basic element (Figure 5) (page 3 para 0026 lines 1-22).

Hoffman does not disclose the semiconductor chip is a CMOS chip with bumps.

Kaifu et al. discloses a radiation image pickup device with a CMOS chip (104) with bumps (107) (Figure 7) since it has low cost and high performance (col. 3 lines 40-41).

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention was made to replace the semiconductor chip disclosed by Hoffman with the CMOS chip disclosed by Kaifu et al. in order to make the device have a low cost.

Hoffman does not disclose that the intermediate layers each contain at least two adhesives of different consistency; a first of said adhesives is a rapidly-curing epoxy resin adhesive.

Wu et al. discloses a snap-cure (i.e. rapidly-curing) epoxy resin adhesive which is mixed with a second adhesive in order to allow for snap curing without a loss of strength or flexibility (col. 1 lines 54-67; col. 2 lines 5-11). Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention was made to add the snap-cure epoxy resin adhesive disclosed by Wu et al. to the adhesives disclosed by Hoffman in the manner as taught by Wu et al. in order to allow for snap curing without a loss of strength or flexibility.

Hoffman & Kaifu et al. do not disclose spacers between the scintillator and the CMOS chip.

Haruo et al. discloses an X-ray detector which discloses a photodiode array (2) and a scintillator array (3), wherein the thickness between the two arrays is regulated by spacers (5) (Figure 1) sufficient to absorb warping and roughness and to make the space uniform and improve uniformity of a detection sensitivity (ABSTRACT Lines 1-4) Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention was made to add the spacers disclosed by Haruo et al. to the layer between the scintillator and the CMOS chip disclosed by Hoffman & Kaifu et al. in order to regulate the thickness between the layers, absorb warping and roughness, and to make the space uniform and improve uniformity of a detection sensitivity.

Hoffman & Kaifu et al. do not disclose spacers between the basic element and the CMOS

chip.

Haruo et al. discloses the X-ray detector uses spacers between elements to regulate the roughness and warping to uniformity of the space between the elements. Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention was made to add the spacers disclosed by Haruo et al. to the layer between the basic element and the CMOS chip disclosed by Hoffman & Kaifu et al. in order that the CMOS chip be uniform when receiving the X-ray quanta (Figure 3-Hoffman)

Hoffman does not disclose that a second of said adhesives is a low-viscosity bubble-free epoxy adhesive.

Haruo et al. discloses the X-ray detector uses transparent epoxy adhesive which fills the space between the spacers without including air bubbles in order to allow the light to enter the array uniformly so that a uniform sensitivity distribution is obtained in any direction (SOLUTION lines 3; 9-12).

Wu et al. teaches that a low viscosity is an inherent property of void-free/bubble free adhesive (col. 1 lines 63-67). Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention was made to replace the adhesive in the intermediate layer disclosed by Hoffman with the low-viscosity bubble-free epoxy adhesive disclosed by Haruo et al. and taught by Wu et al. in order to allow the light to enter the array uniformly so that a uniform sensitivity distribution is obtained in any direction.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman, Kaifu et al., Haruo et al., & Wu et al. as applied to claims 1-4, 6, 7, & 12-16 above, and further in view of Doyle et al. (U.S. Patent 6063688).

Hoffman, Kaifu et al., Haruo et al., & Wu et al. disclose all of the instant claimed invention as stated above in the rejection of claims 1-4, 6, 7, & 12-16, but do not disclose the spacer is a

wire.

Doyle et al. discloses the fabrication of deep submicron structures and quantum wire transistors using hard-mark transistor width definition, wherein quantum wires are used as spacers for the formation of gaps/trenches in the substrate surface (col. 7 lines 50 & 55-57). Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention was made to replace the spacers disclosed by Hoffman, Kaifu et al., Haruo et al., & Wu et al. with spacers/wires, as taught by Doyle et al. since the spacers claimed by Applicant and the spacers used by Hoffman, Kaifu et al., Haruo et al., & Wu et al. are alternate types of spacers which will perform the same function, if one is replaced with the other, of creating gaps between dielectric elements.

Hoffman, Kaifu et al., Haruo et al., Wu et al., & Doyle et al. do not disclose the spacer/wire consists of the materials Au and AlSi. However, the particular type of material used to make the spacers/wires, absent any criticality, is only considered to be the use of a "preferred" or "optimum" material out of a plurality of well known commonly available, low-cost materials that a person having ordinary skill in the art at the time the invention was made would have find obvious to provide using routine experimentation based, among other things, on the intended use of Applicant's apparatus, i.e., suitability for the intended use of Applicant's apparatus, and since the courts have stated that a selection of a material on the basis of suitability for intended use of an apparatus would be entirely obvious. See In re Leshin, 125 USPQ 416 (CCPA 1960). Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention was made to make the spacers disclosed by Hoffman, Kaifu et al., Haruo et al., Wu et al., & Doyle et al. out of Au and AlSi in order to reduce manufacturing costs.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman, Kaifu et

al., Haruo et al., & Yamamoto et al. as applied to claims 1-4,6, 7, & 12-16 above, and further in view of Boedinger et al. (U.S. Patent 6149478).

Hoffman, Kaifu et al., Haruo et al., & Wu et al. disclose all of the instant claimed invention as stated above in the rejection of claims 1-4,6, 7, & 12-16, but do not disclose the basic element is a ceramic element based on aluminum oxide.

Boedinger et al. disclose a method of manufacturing large crystal bodies, (i.e. scintillators) using aluminum oxide for the reflection layer of the lining/base element (col. 2 lines 41-45). Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention was made to make the basic element disclosed by Hoffman, Kaifu et al., Haruo et al., & Wu et al. out of aluminum oxide in order to provide a suitable reflection surface for the scintillator.

Response to Arguments

6. Applicant's arguments with respect to claims 1-8 & 12-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Travis M. Reis whose telephone number is (571) 272-2249. The examiner can normally be reached on 8--5 M--F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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Travis M Reis
Examiner
Art Unit 2859

tmr
May 31, 2007



Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800